



U.S. Department of Health and Human Services



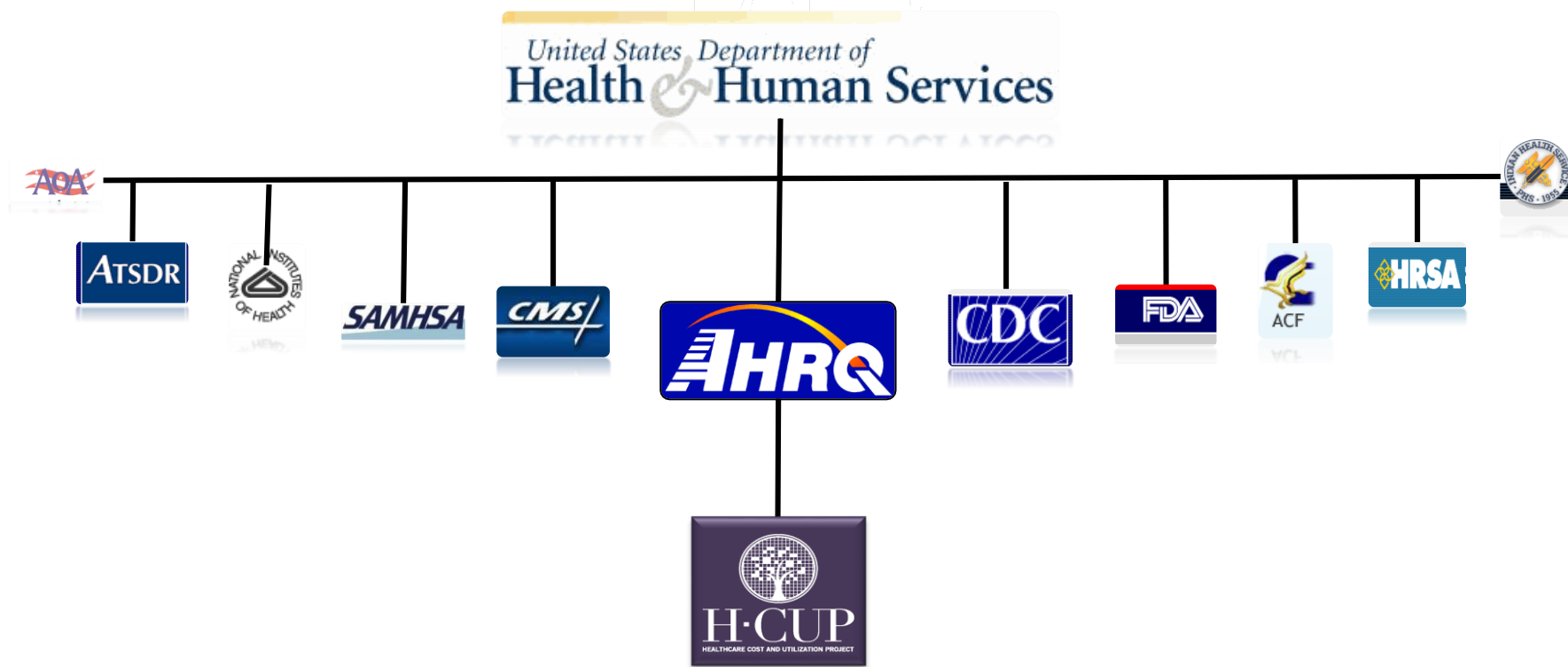
Agency for Healthcare Research and Quality

Advancing Excellence in Health Care • www.ahrq.gov

Healthcare Cost and Utilization Project (HCUP) Administrative Data: Inpatient, Emergency Department, and Ambulatory Surgery Care

What is AHRQ?

The Agency for Healthcare Research and Quality (AHRQ) is a Federal agency under the U.S. Department of Health and Human Services (HHS)



- To produce evidence to make health care
 - safer
 - higher quality
 - more accessible
 - equitable
 - affordable for all Americans
- To work with HHS and other partners to make sure that the evidence is understood and used

HCUP is a comprehensive set of publicly available all-payer health care data



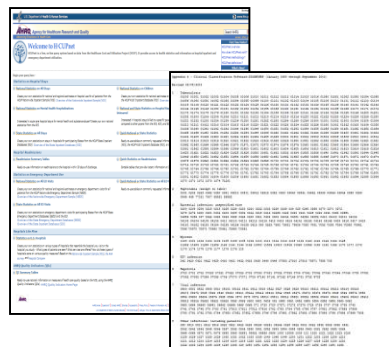
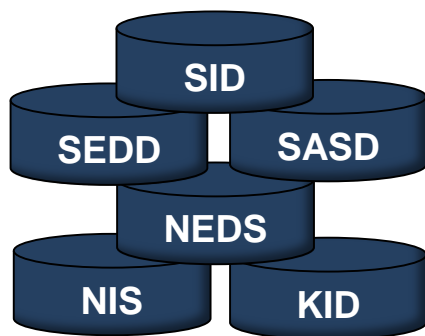
Includes multiyear inpatient and outpatient data based on hospital billing records

HCUP
Databases

Research
Tools

Research
Publications

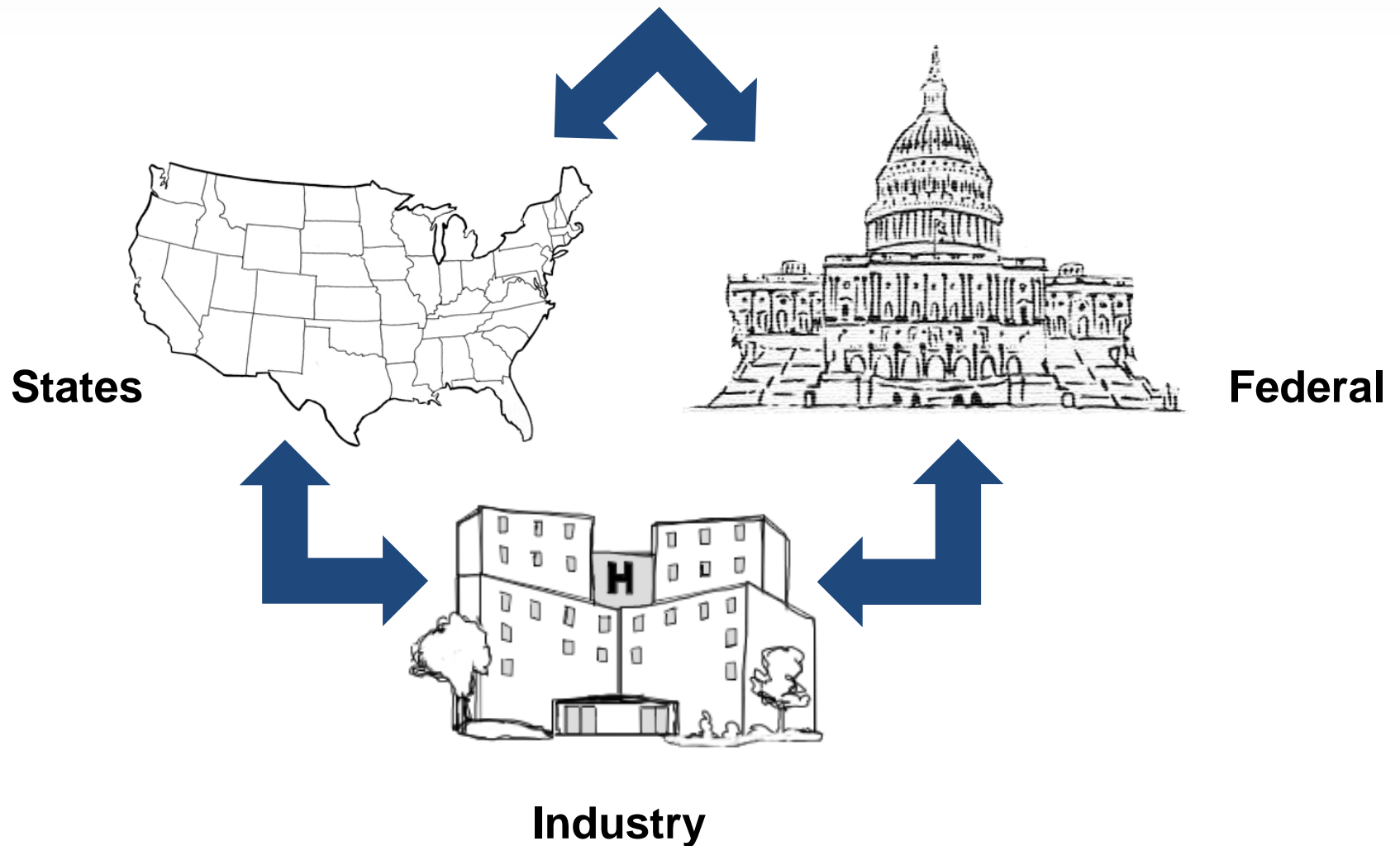
User Support



Types of Topics HCUP Can Address

- Use and cost of hospital-based care
- Readmissions and revisits
- Expected payer
- Medical treatment variations
- Hospital characteristics
- Cost and burden of illness
- Uncommon conditions
- Quality of care
- Patient safety
- Access to care
- Special populations and minorities
- Care of pediatric patients
- Epidemiology of diseases and treatments
- Injury surveillance

Costs of care	Septicemia was the most expensive reason for hospitalization in 2012—totaling over \$20 billion in aggregate hospital costs (NIS)
Access to care	Americans in low-income areas visit EDs at rates 90 percent higher compared to those in the highest income areas (NEDS)
Quality of care	Observed inpatient mortality rates among adults declined continually and substantially from 2000 through 2012 for four high-volume conditions: 46 percent for acute myocardial infarction, 34 percent for congestive heart failure, 29 percent for stroke, and 49 percent for pneumonia (NIS)
Readmissions	For CHF, schizophrenia, and renal failure, at least 1 in 5 patients were readmitted within 30 days (SID with readmissions link)
Patient Safety	In 2011, the four most frequent causes of adverse drug events (ADEs) originating in the hospital were steroids, antibiotics, opiates and narcotics, and anticoagulants (SID)
Geographic variation	ED visits were higher in counties with fewer primary care MDs per capita (SEDD)





Current HCUP Data Partners



Alaska State Hospital and Nursing Home Association

Arizona Department of Health Services

Arkansas Department of Health

California Office of Statewide Health Planning & Development

Colorado Hospital Association

Connecticut Hospital Association

District of Columbia Hospital Association ★

Florida Agency for Health Care Administration

Georgia Hospital Association

Hawaii Health Information Corporation

Illinois Department of Public Health

Indiana Hospital Association

Iowa Hospital Association



Current HCUP Data Partners



Kansas Hospital Association

Kentucky Cabinet for Health and Family Services

Louisiana Department of Health and Hospitals

Maine Health Data Organization

Maryland Health Services Cost Review Commission

Massachusetts Center for Health Information and Analysis

Michigan Health & Hospital Association

Minnesota Hospital Association

Mississippi Department of Health

Missouri Hospital Industry Data Institute

Montana MHA – An Association of Montana Health Care Providers

Nebraska Hospital Association



Current HCUP Data Partners



Nevada Department of Health and Human Services
New Hampshire Department of Health & Human Services
New Jersey Department of Health
New Mexico Department of Health
New York State Department of Health
North Carolina Department of Health and Human Services
North Dakota Minnesota Hospital Association
Ohio Hospital Association
Oklahoma State Department of Health
Oregon Association of Hospitals and Health Systems,
Health Authority
Pennsylvania Health Care Cost Containment Council



Current HCUP Data Partners



Rhode Island Department of Health

South Carolina Revenue and Fiscals Affairs Office

South Dakota Association of Health Care Organizations

Tennessee Hospital Association

Texas Department of State Health Services

Utah Department of Health

Vermont Association of Hospitals and Health Systems

Virginia Health Information

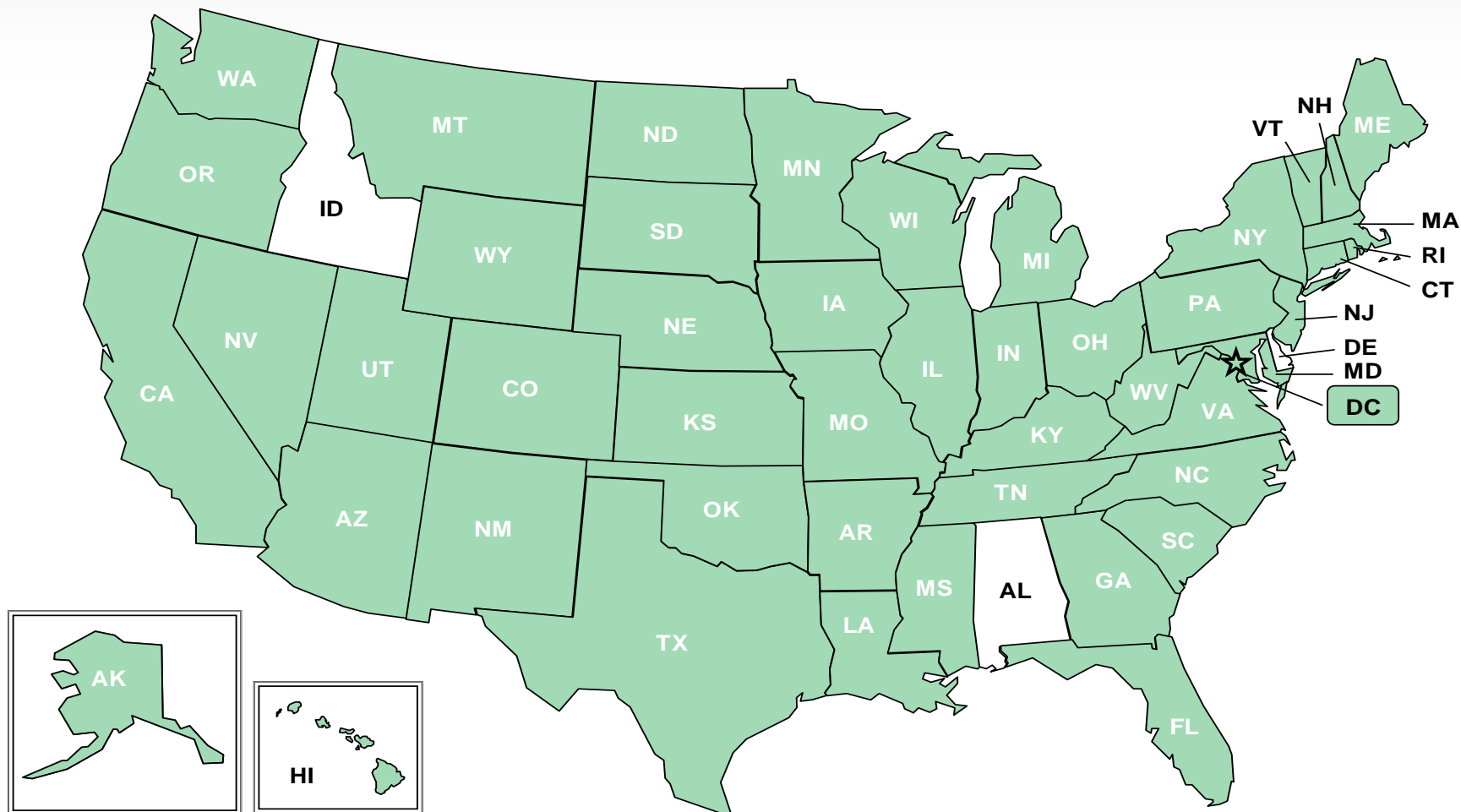
Washington State Department of Health

West Virginia Health Care Authority

Wisconsin Department of Health and Family Services

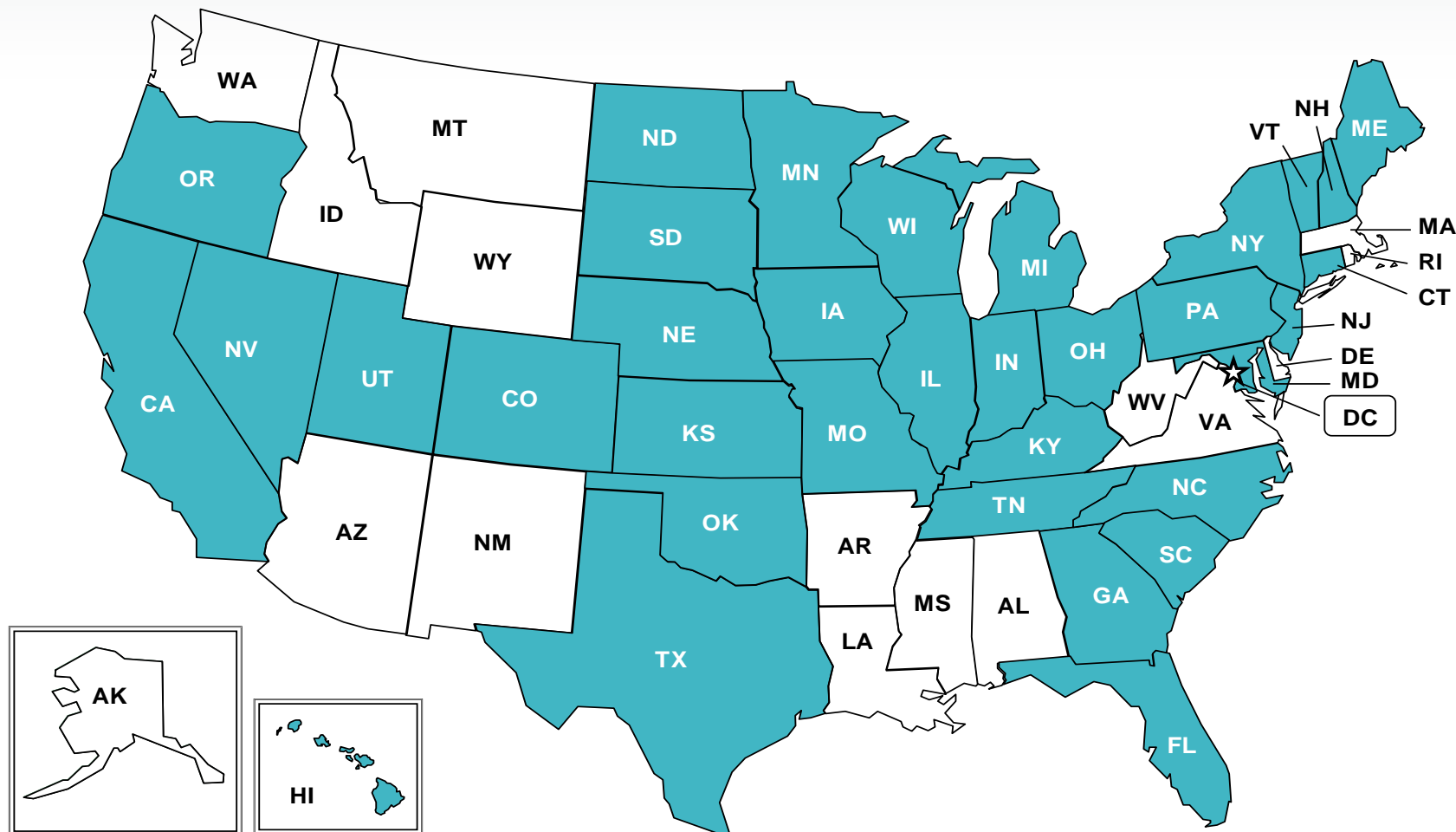
Wyoming Hospital Association

HCUP Partners Providing Inpatient Data



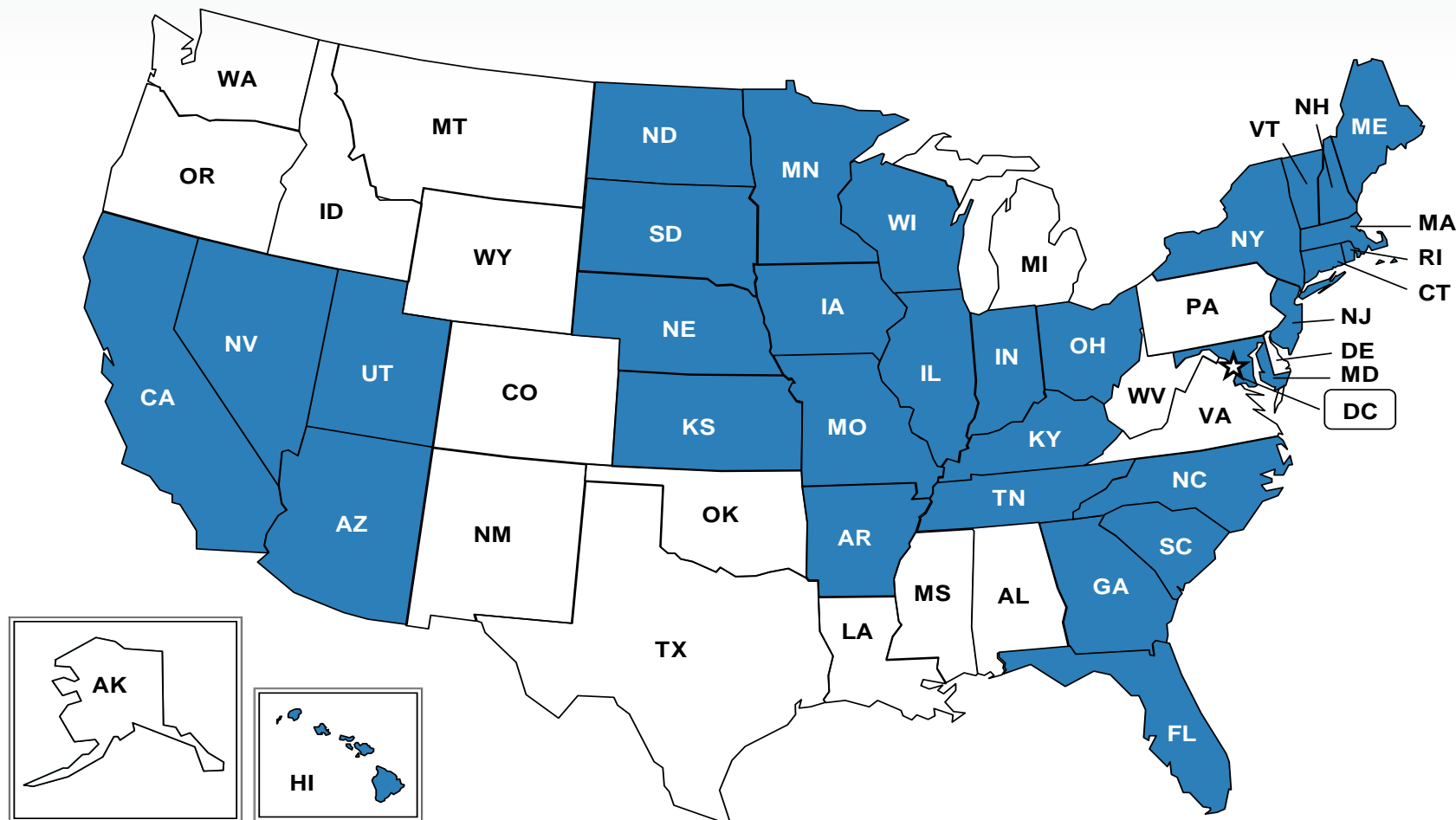
Partners Providing:	Inpatient Data	Non-participating
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HCUP Partners Providing Ambulatory Surgery & Services Data



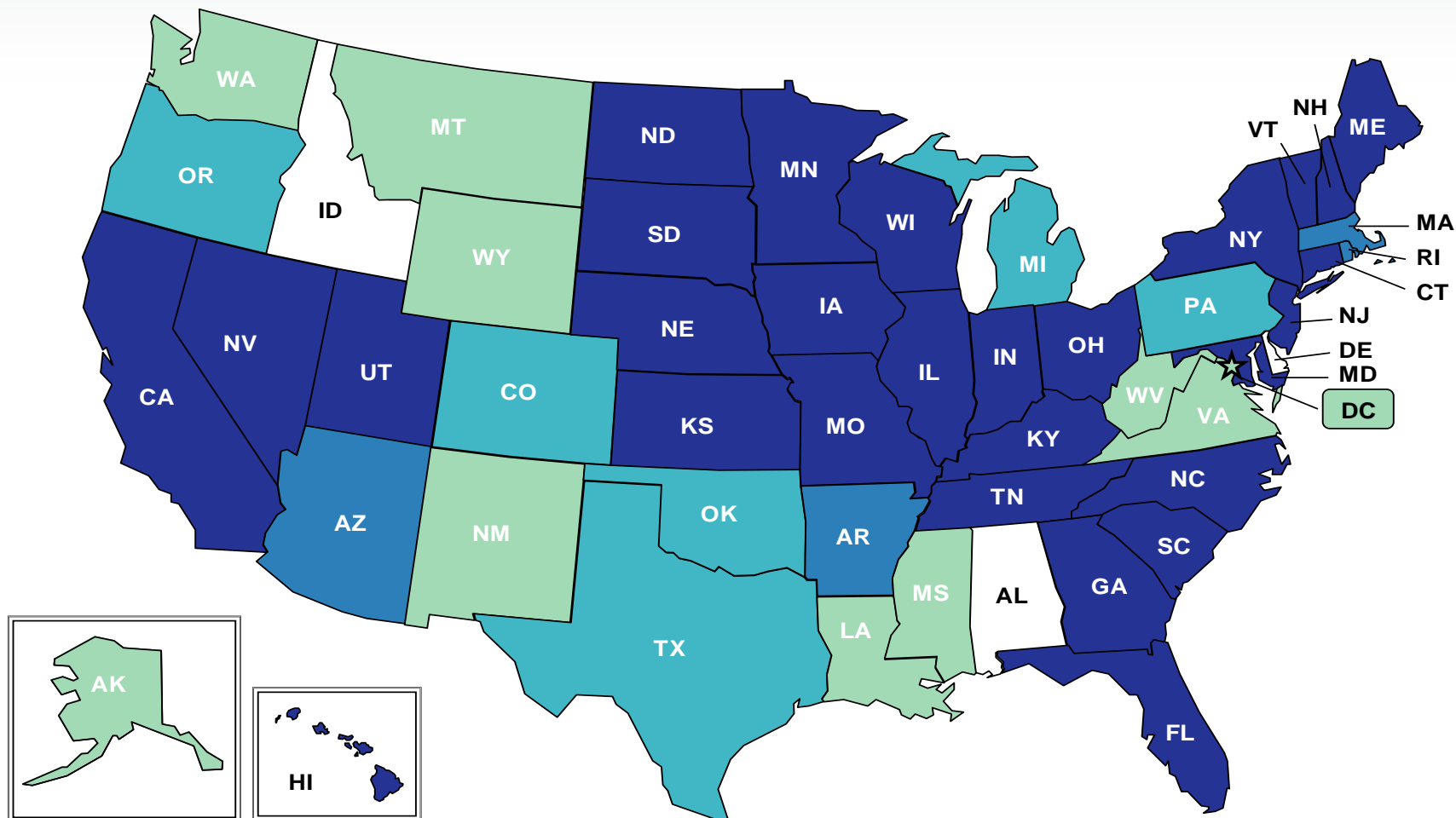
Partners Providing:	Ambulatory Surgery & Services Data	Non-participating
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HCUP Partners Providing Emergency Department Data



Partners Providing:	Emergency Department Data	Non-participating
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HCUP Participation by Data Type



Partners Providing:	Inpatient Data	Inpatient and Ambulatory Surgery & Services Data	Inpatient and Emergency Department Data	Inpatient, Ambulatory Surgery & Services, and Emergency Department Data	Non-participating
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The Foundation of HCUP Data Is Hospital Billing Data



H·CUP
HEALTHCARE COST AND UTILIZATION PROJECT

UB-04
CMS 1500

Demographic
Data

Diagnoses
Procedures
Charges

1500
HEALTH INSURANCE CLAIM FORM
APPROVED BY NATIONAL UNIFORM CLAIM COMMITTEE (08/05)

1. PATIENT'S NAME (Last Name, First Name, Middle Initial)
Smith, Bob A.

2. PATIENT'S BIRTH DATE
12 18 36 M

3. PATIENT'S ADDRESS (incl. Street)
123 Paradise Road

4. CITY
Seattle

5. STATE
WA

6. ZIP CODE
12345

7. TELEPHONE (Include Area Code)
(555) 555-1234

8. OTHER INSURED'S NAME (Last Name, First Name, Middle Initial)

9. PATIENT'S CONDITION

10. OTHER INSURED'S POLICY OR GROUP NUMBER

11. OTHER INSURED'S DATE OF BIRTH

12. EMPLOYER'S NAME OR SCHOOL NAME

13. INSURANCE PLAN NAME OR PROGRAM NAME

14. DATE OF CURRENT ILLNESS (First symptoms or pregnancy date)

15. PATIENT HAS HAD SAME OR DIFFERENT ILLNESS (Specify Usual Occurrence)

16. NAME OF REFERRING PROVIDER OR OTHER SOURCE

17. NPI

18. RESERVED FOR LOCAL USE

19. DIAGNOSIS OR NATURE OF ILLNESS OR INJURY (Please itemize 1, 2, 3 or 4 to item 24) (by line)

20. V98 61

21. DATES OF SERVICE

22. PROCEDURES, SERVICES, OR SUPPLIES

23. CPT/HCPCS CODES

24. CPT/HCPCS CODES

25. FEDERAL TAX ID NUMBER

26. PATIENT'S ACCOUNT NO.

27. FACILITY ASSIGNMENT

28. TOTAL CHARGE

29. AMOUNT PAID

30. BALANCE DUE

31. SIGNATURE OF PHYSICIAN OR SUPPLIER

32. OFFICE NAME

33. PROVIDER NAME

34. ADDRESS

35. CITY

36. STATE

37. ZIP CODE

38. DATE

39. NPI

40. APPROVED OMB NO.

41. NUBC Instruction Manual available at: www.nucc.org

42. APPROVED OMB-0938-0999 FORM CMS-1500 (08/05)

Samp
CMS-1500

1. PATIENT NAME

2. PATIENT ADDRESS

3. PATIENT BIRTH DATE

4. PATIENT BIRTH SEX

5. PATIENT BIRTH DATE

6. PATIENT BIRTH SEX

7. PATIENT BIRTH DATE

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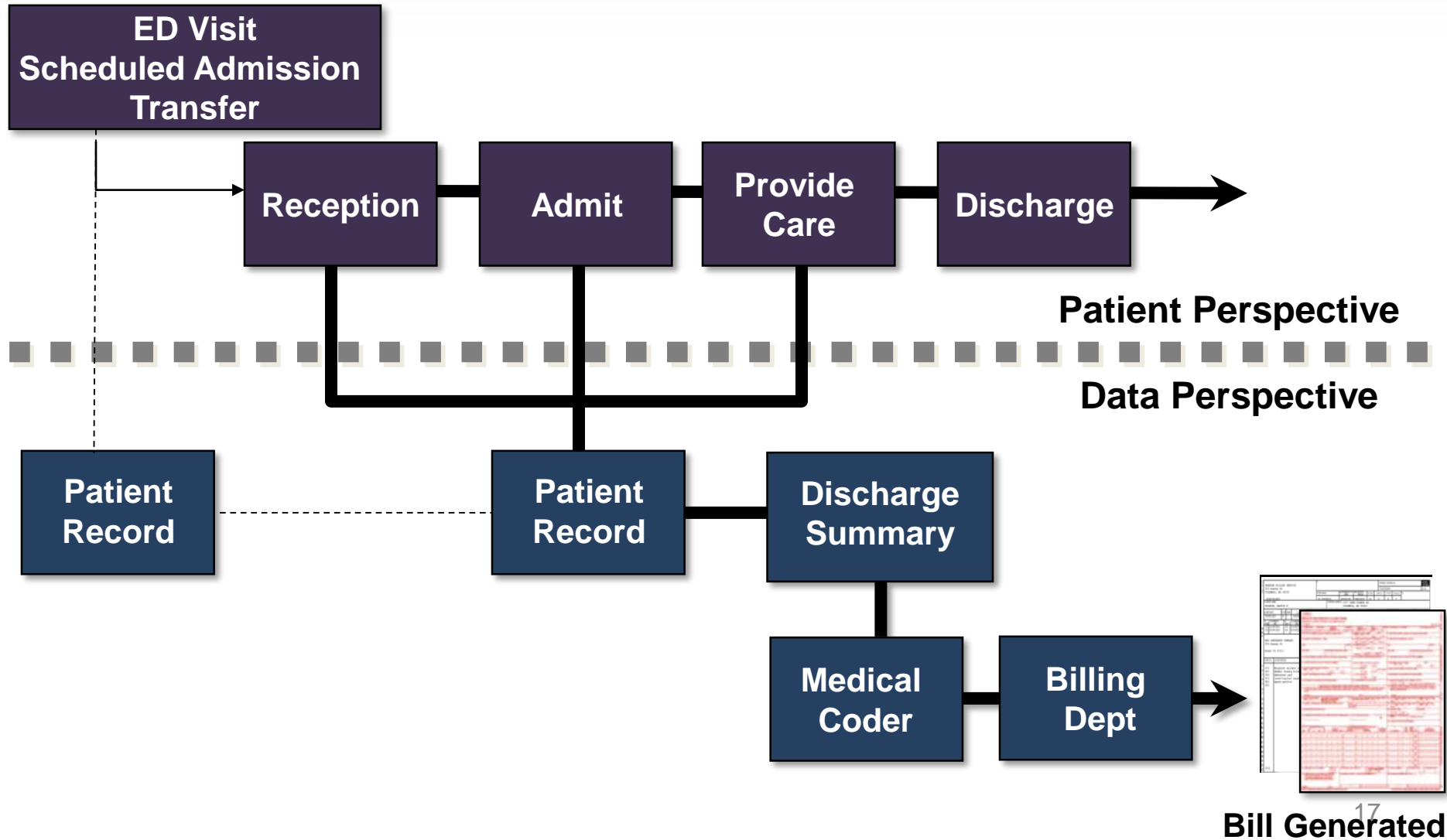
97. PATIENT BIRTH DATE

98. PATIENT BIRTH SEX

99. PATIENT BIRTH DATE

100. PATIENT BIRTH SEX

From Patient Hospital Visit to HCUP Record



Hospital Billing Data Have Benefits and Limitations

Benefits

Large number of visit records

Uniformity of coding

Routine, regular collection

Ease of access

All-payer

Available at local, State, regional, and national level

Supplemental files available to facilitate research

Limitations

Differences in coding across hospitals

Limited clinical details

Lack revenue information

Include most but not all hospitals

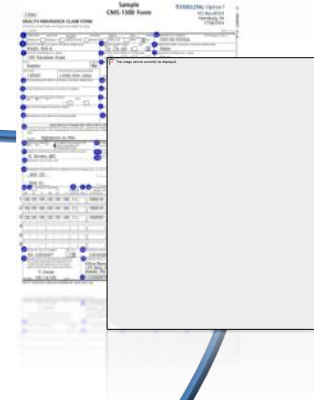
May not show complete experience of care

No data on individuals outside of hospital system

Patient enters
hospital



Billing
record
created



Hospital sends
billing data and any
additional data
elements to data
organizations

744	98	749	2	79	257	5	290
745	25	614	4	84	541	4	549
746	68	195	1	78	669	3	523
747	43	726	3	46	211	4	970
748	81	533	6	98	83	8	40
749	51	418	4	69	496	1	613
750	16	574	2	77	571	1	995
751	2	326	4	44	638	2	958
752	63	571	4	15	217	8	721
753	38	867	4	44	446	2	71
754	50	418	0	59	216	4	759
755	22	806	3	46	573	2	994
756	94	740	6	55	247	1	218
757	36	852	8	8	289	3	559
758	63	386	1	94	838	5	613
759	17	766	8	92	799	5	612
760	54	735	3	29	556	6	503
761	5	263	4	75	125	8	997
762	48	100	3	94	484	8	206
763	23	916	6	15	556	9	327
764	11	251	4	17	125	6	192
765	30	976	1	9	561	6	39

States store data in
varying formats

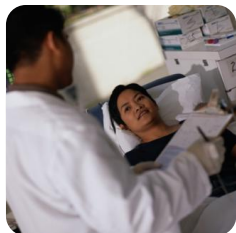
AHRQ standardizes
data to create
uniform HCUP
databases



- AHRQ standardizes data to create uniform HCUP databases
- Additional data elements are added:
 - ▶ Value-added variables – injury indicators, chronic condition indicators, procedure class
 - ▶ Hospital characteristics – teaching status, ownership or control, bed size
 - ▶ Diagnostic-related groups and severity measures –
 - AHRQ's Clinical Classifications Software (CCS)
 - 3M's All Patient Refined DRGs (APR-DRGs)
- Quality checks are performed

HCUP Has Six Types of Databases

- Three State-level databases



State
Inpatient
Databases
(SID)



State
Ambulatory
Surgery and
Services
Databases
(SASD)



State
Emergency
Department
Databases
(SEDD)

- Three nationwide databases



National
(Nationwide)
Inpatient
Sample
(NIS)



Nationwide
Emergency
Department
Sample
(NEDS)



Kids'
Inpatient
Database
(KID)

State Inpatient
Databases
(SID)

Inpatient hospital discharge data (including admissions that started in the ED) from participating HCUP States

State Ambulatory
Surgery & Services Databases
(SASD)

Ambulatory surgery data (ambulatory surgery and other services from hospital-owned and sometimes nonhospital-owned facilities) from participating HCUP States

State Emergency
Department Databases
(SEDD)

Emergency department data (treat and release) from participating HCUP States



Many Potential Applications of HCUP State Databases



- Investigate questions unique to one State
- Compare utilization or outcomes in two or more States
- Conduct market area research or small area variation analyses
- Identify State-specific trends in hospital care, utilization, access, charges, and outcomes

What Are Community Hospitals?

American Hospital Association (AHA) Definition:

Non-Federal, short-term, general, and other specialty hospitals

Community Hospitals

General multispecialty hospitals

Specialty hospitals (e.g., surgical, cancer, OB-GYN, heart, orthopedic)

Pediatric

Public

Academic medical centers

Short-stay rehabilitation

Noncommunity Hospitals

DoD, VA, IHS

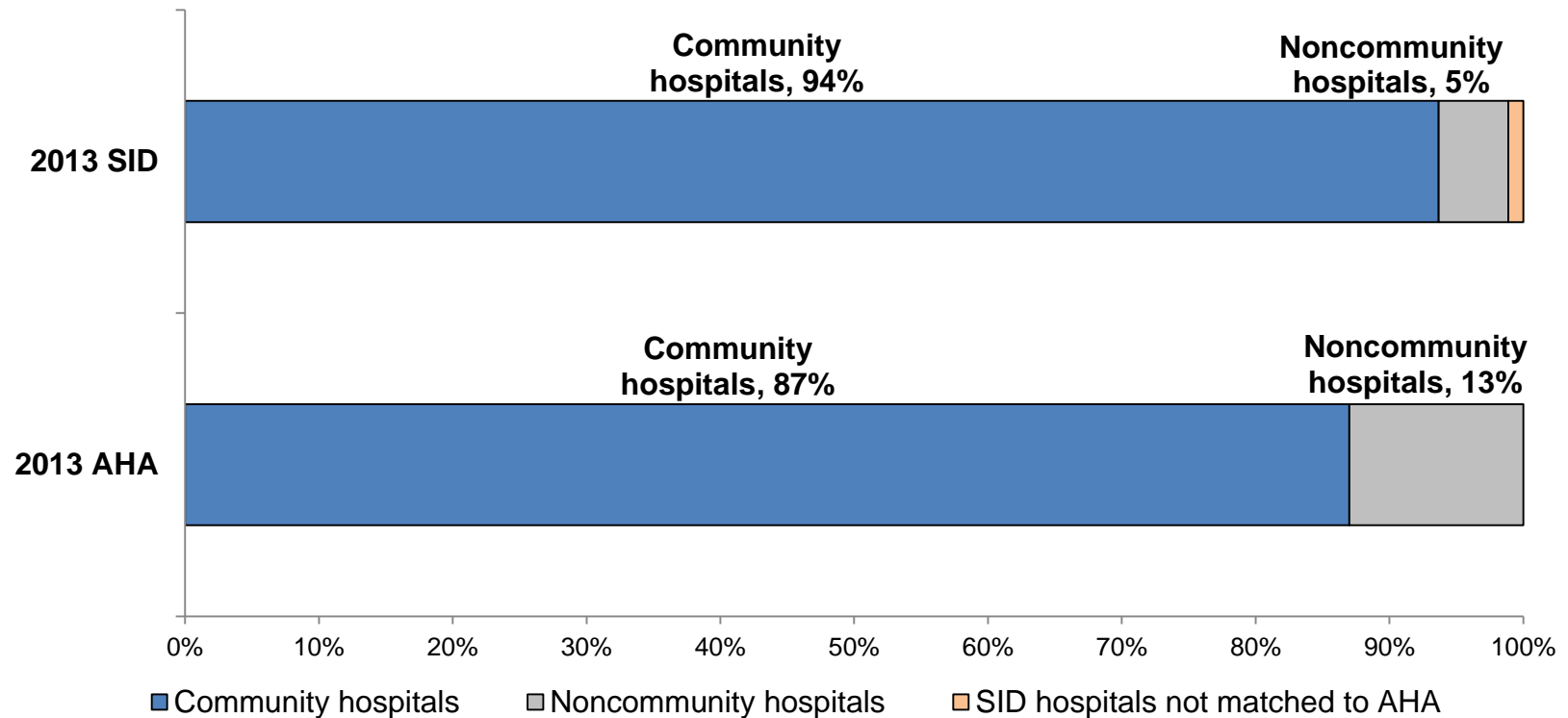
Psychiatric

Alcoholism and chemical dependency

Prison hospitals or college infirmaries

Long-stay rehabilitation and long-term care

The SID contain mostly community hospitals, but also some noncommunity hospitals



- HCUP generally does not receive data from psychiatric hospitals
- However, information for a patient who is treated for a mental health or substance abuse condition in a community hospital is included

Most Frequent Principal Diagnosis	Number of Discharges (thousands)
1. Newborns	3,795
2. Septicemia	1,133
3. Pneumonia	1,007
4. Osteoarthritis	968
5. Congestive Heart Failure	876
6. Mood disorders	847
7. Cardiac dysrhythmias	749

Source: National Inpatient Sample, 2012

Common Data Elements in the HCUP Databases

- Patient demographics (age, sex)
- Diagnoses & procedures
- Expected payer
- Length of stay
- Patient disposition
- Admission source & type
- Admission month
- Weekend admission

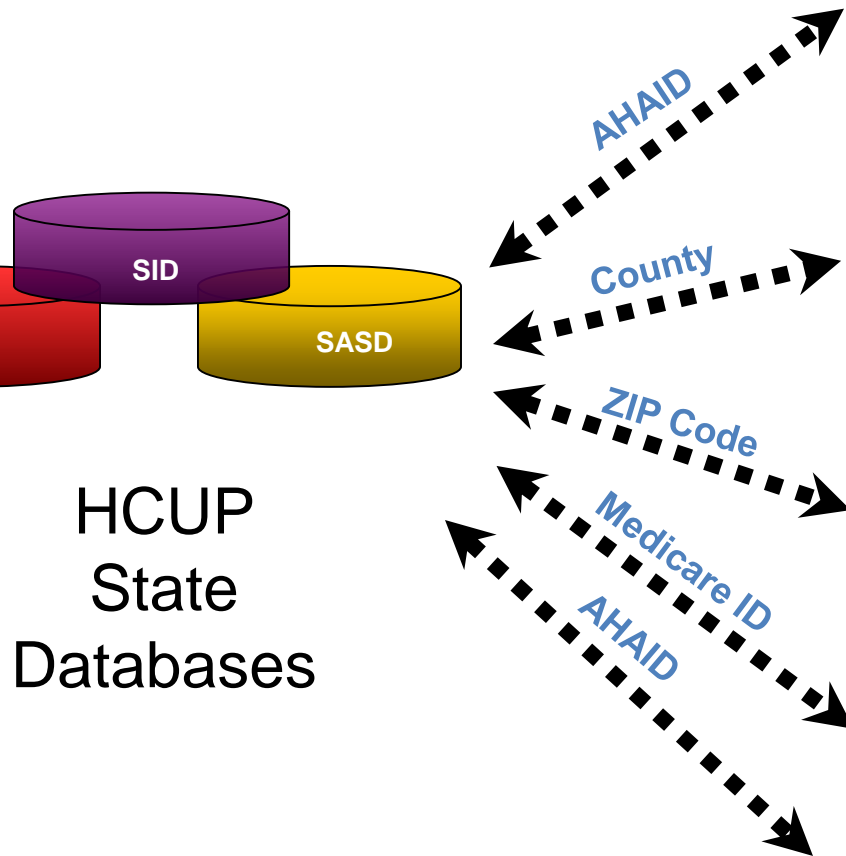


Some Data Elements Vary by State

- Race/ethnicity
- Patient county
- Patient ZIP code
- Birthweight
- Procedure date (days from admission)
- Health plan details
- Additional expected payers
- Detailed charges
- Patient identifiers encrypted
- Physician identifiers encrypted
- Physician specialty
- Hospital identifier unencrypted



Link to Other Databases for Additional Information



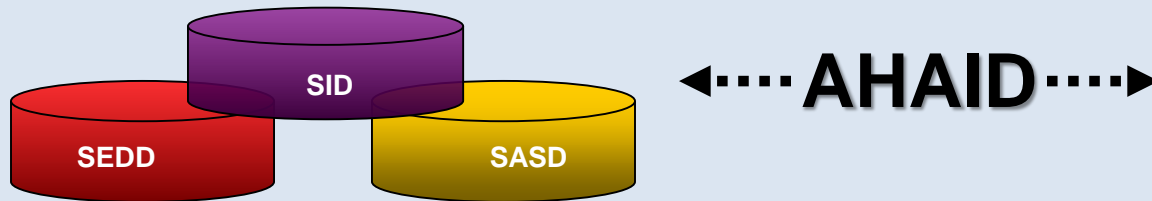
American Hospital Association
(AHA) Annual Survey

The Health Resources and
Services Administration (HRSA)
Area Health Resource File
(AHRF)

Zip Code Files From U.S.
Census or Vendor

Medicare Cost Reports

Trauma Information Exchange
Program (TIEP)

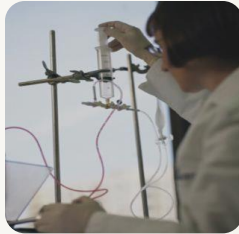


HCUP Data Can Be Linked to the AHA Annual Survey via the **AHAID** Variable

The AHA Linkage File includes:

- AHA hospital identifier (AHAID)
- State hospital identifier (DSHOSPID)
- HCUP hospital identifier (HOSPID)
- Hospital FIPS State/county code
- Hospital State
- Year

National (Nationwide)
Inpatient Sample
(NIS)



Inpatient discharge data for a sample of discharges from all hospitals in SID

NIS
Redesign

Nationwide Emerg.
Dept. Sample
(NEDS)



Emergency department data (treat and release and admitted) from a sample of hospitals in SID and SEDD

Kids' Inpatient
Database
(KID)



Pediatric inpatient hospital discharge data from a sample of pediatric discharges in SID

- The 2012 NIS was redesigned to improve national estimates with reductions in sampling error, and to enhance data confidentiality.
- To highlight the design change, beginning with 2012 data, AHRQ renamed the NIS from the "***Nationwide*** Inpatient Sample" to the "***National*** Inpatient Sample"



2012 NIS Redesign: Key Changes



1. NIS is now a ***sample of discharge records*** from all HCUP-participating hospitals, rather than a sample of hospitals from which all discharges were retained
2. NIS now uses the ***definitions of hospitals*** and discharges supplied by the statewide data organizations that contribute to HCUP, rather than the definitions used by the AHA Annual Survey
3. NIS now ***eliminates State and hospital identifiers*** and other data elements that are not uniformly available across States



Many Potential Applications of HCUP National Databases



- National and regional estimates
- Utilization, charges, and outcomes
- Utilization of health services by priority populations
- Hospital care for rare conditions
- Quality of care and patient safety
- Impact of health policy changes
- Access to care



State and Nationwide Database Size



	Inpatient Data			Emergency Department Data		Ambulatory Surgery and Services Data
HCUP Database	SID (2012)	NIS (2012)	KID (2012)	SEDD (2012)	NEDS (2012)	SASD (2012)
Hospitals	4,400	4,400	4,100	2,700	1,000	3,500
Records	35 million	7 million	3 million	75 million	29 million	8 million
Derived From	–	SID	SID	–	SID & SEDD	–
Includes	All discharges for a given State, including ED admissions	Sample of inpatient discharges (all ages) in 2012; sample of hospitals prior to 2012	Sample of pediatric inpatient discharges	All ED visits that do not result in an admission to the same hospital	Sample of hospital-based EDs with ED admissions and ED outpatient visits	Encounter-level data for ambulatory surgeries and may also include various types of outpatient services



Comparing SID with NIS



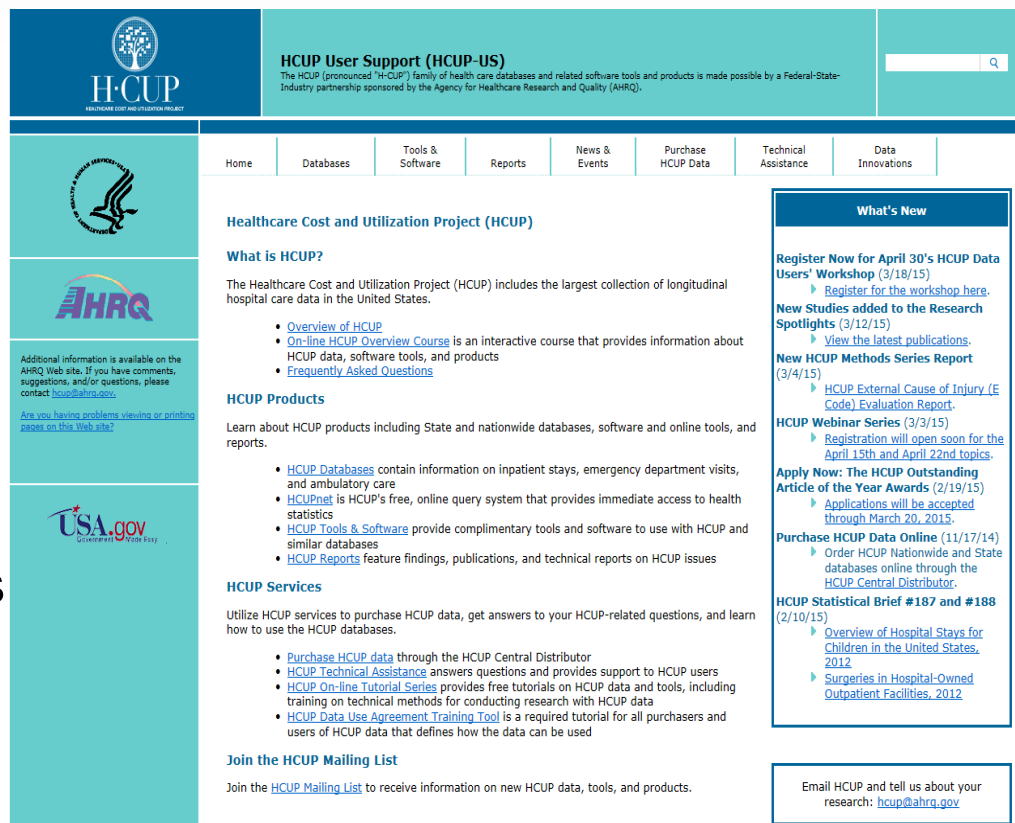
SID	NIS
Link to AHA Annual Survey (for some States)	Only 2011 and prior
Revisit analyses possible (for some States)	Not applicable
State-specific data elements and detailed coding	Common data elements and HCUP uniform coding
State, local market area, and community stats	Generate national and regional estimates

- Six types of HCUP databases
- Databases are based on administrative hospital data: inpatient, ED, and ambulatory surgery and services
- Available for multiple years
 - ▶ National
 - NIS (1988–2012)
 - NEDS (2006–2012)
 - KID (1997, 2000, 2003, 2006, 2009, 2012)
 - ▶ State
 - SID (1990–2013)
 - SASD (1997–2013)
 - SEDD (1999–2013)
- Can look at breadth and depth of health care issues

HCUP User Support HCUP-US Web Site

- Easy access to information on
 - ▶ HCUP databases
 - ▶ Tools and software
 - ▶ HCUP-related reports and publications
 - ▶ News and upcoming events
 - ▶ Technical assistance

More than 1.3 M
Web site
visits annually



The screenshot shows the HCUP User Support (HCUP-US) website. The header includes the H-CUP logo and the text "HCUP User Support (HCUP-US)" with a description: "The HCUP (pronounced 'H-CUP') family of health care databases and related software tools and products is made possible by a Federal-State-Industry partnership sponsored by the Agency for Healthcare Research and Quality (AHRQ)." Below the header is a navigation bar with links: Home, Databases, Tools & Software, Reports, News & Events, Purchase HCUP Data, Technical Assistance, and Data Innovations. The main content area is divided into several sections: "Healthcare Cost and Utilization Project (HCUP)", "What is HCUP?" (describing the project and providing links to Overview of HCUP, On-line HCUP Overview Course, and Frequently Asked Questions), "HCUP Products" (describing State and nationwide databases, software, and online tools, and providing links to HCUP Databases, HCUPnet, HCUP Tools & Software, and HCUP Reports), "HCUP Services" (describing services to purchase HCUP data, get answers to questions, and learn how to use the data, and providing links to Purchase HCUP data, HCUP Technical Assistance, HCUP On-line Tutorial Series, and HCUP Data Use Agreement Training Tool), "Join the HCUP Mailing List", and "What's New" (listing recent events and publications, including the April 30th HCUP Data Users' Workshop, New Studies added to the Research Spotlights, New HCUP Methods Series Report, HCUP External Cause of Injury (E Code) Evaluation Report, HCUP Webinar Series, Registration for the April 15th and April 22nd topics, Apply Now: The HCUP Outstanding Article of the Year Awards, Applications will be accepted through March 20, 2015, Purchase HCUP Data Online, Order HCUP Nationwide and State databases online through the HCUP Central Distributor, HCUP Statistical Brief #187 and #188, Overview of Hospital Stays for Children in the United States, 2012, and Surgeries in Hospital-Owned Outpatient Facilities, 2012). A footer box encourages users to email HCUP and tell about their research: hcup@ahrq.gov.


<http://www.hcup-us.ahrq.gov>



NIS Database Documentation

The National (Nationwide) Inpatient Sample (NIS) is the largest publicly available all-payer inpatient care database in the United States, containing data on more than seven million hospital stays each year.

[Home](#)
[Databases](#)
[Tools & Software](#)
[Reports](#)
[News & Events](#)
[Purchase HCUP Data](#)
[Technical Assistance](#)
[Data Innovations](#)



New! 2012 NIS Redesign. For more details, refer to the [NIS Redesign Report](#).

The National (Nationwide) Inpatient Sample (NIS)

The National (Nationwide) Inpatient Sample (NIS) is the largest all-payer inpatient care database in the United States, containing data on more than seven million hospital stays. Its large sample size is ideal for developing national and regional estimates and enables analyses of rare conditions, uncommon treatments, and special populations. The following links provide detailed documentation for the NIS.

Description of NIS Files

- Introduction to the NIS
 - 2012 ([PDF](#) file, 624 KB; [HTML](#))
 - [Prior Years](#)
- HCUP Quality Control Procedures ([PDF](#) file, 345 KB; [HTML](#))
- [File Specifications](#)
- [New NIS Trend Weights](#)

Restrictions on the Use of the NIS

- Data Use Agreement for the National (Nationwide) Databases ([PDF](#) file, 55 KB; [HTML](#))
- [Requirements for Publishing with HCUP Data](#)
- [Sources of NIS Data and State-Specific Restrictions for Prior Years](#)

Load Programs

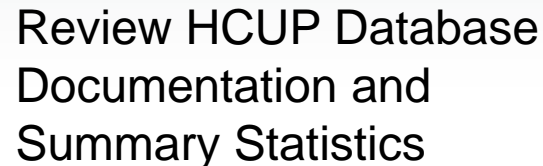
Known Data Issues

- [2000](#)
- [1998-1999](#)
- [1994-1997](#)
- [1993](#)
- [1988-1992](#)
- For NIS data 2011 and earlier, revised weights should be used to make estimates comparable to later data. Refer to the [NIS Trends Weights Files](#).

HCUP Tools: Labels and Formats

- [Clinical Classifications Software \(CCS\)](#)
- Format Programs
 - [DRG Formats Program](#) (TXT file, 1.3 MB) *Creates SAS formats to label the values of each DRG and MDC category*

<https://www.hcup-us.ahrq.gov/databases.jsp>



Review
Methods
Reports and
Online Tutorials



40



Purchase Data Online Through the HCUP Central Distributor



Step 1: Take Data Use Agreement (DUA) online training
http://www.hcup-us.ahrq.gov/tech_assist/dua.jsp

Step 2: Login or register for an account
http://www.hcup-us.ahrq.gov/tech_assist/centdist.jsp

Step 3: Create your profile under “My Account”

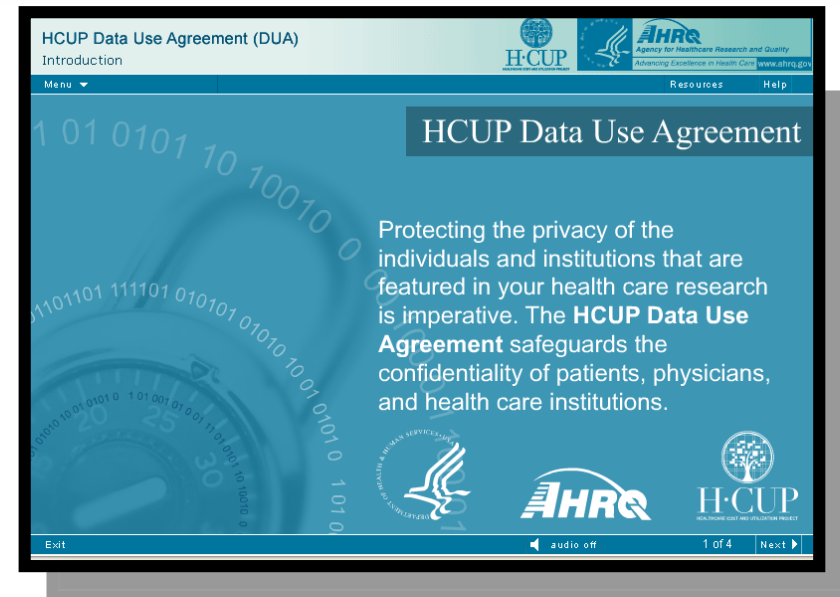
Step 4: Submit online order and complete further instructions listed on the “Thank You” page

For assistance, contact the HCUP Central Distributor:

- ▶ Phone: 866-556-HCUP (4287) toll free
- ▶ Email: HCUPDistributor@ahrq.gov

Requirement: Electronic Data Use Agreement (DUA) Course

- Purpose of the Course:
 - ▶ Emphasize the importance of data protection
 - ▶ Reduce the risk of inadvertent violations
 - ▶ Describe your individual responsibility when using HCUP data



~15 minutes to complete

[www.hcup-us.ahrq.gov/
tech_assist/dua.jsp](http://www.hcup-us.ahrq.gov/tech_assist/dua.jsp)



States Releasing Databases Through HCUP Central Distributor



H·CUP
HEALTHCARE COST AND UTILIZATION PROJECT

- Arizona
- Arkansas
- California
- Colorado
- Florida
- Hawaii
- Iowa
- Kentucky
- Maine
- Maryland
- Massachusetts
- Michigan
- Mississippi
- Nebraska
- Nevada
- New Jersey
- New Mexico
- New York
- North Carolina
- Oregon
- Rhode Island
- South Carolina
- South Dakota
- Utah
- Vermont
- Washington
- West Virginia
- Wisconsin

Remember,
not all States
participate in all
years and for all
databases

Pricing Information per Data Year

Nationwide Databases (NIS, KID, NEDS)

- ▶ **NIS:** \$350 (CY 2010–2012; student price \$50)
\$160–\$200 (earlier years; student price \$20)
- ▶ **KID:** \$350 (CY 2012; student price \$50)
\$200 (earlier years; student price \$20)
- ▶ **NEDS:** \$500 (student price \$75)



National data
free to
Government
agencies





State Databases (SID, SASD, SEDD) – must be purchased

- ▶ Owned by State-level data organizations
- ▶ Access and costs varies by State
- ▶ \$35–\$3,185



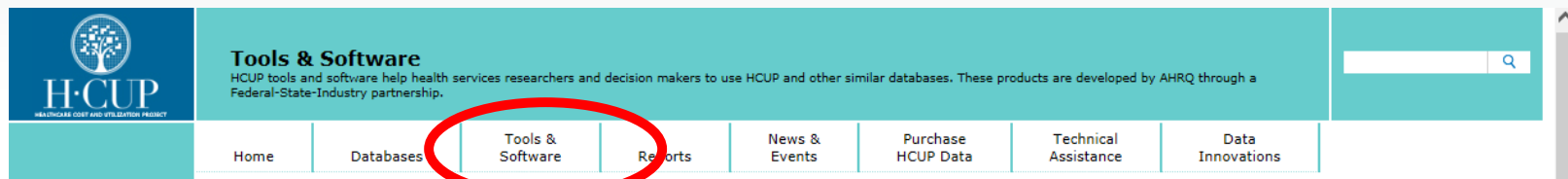
All funds for
State data sales
returned
to State partners

Software Requirements for HCUP and Programs HCUP Provides

Software Package	Load Programs	Format Programs	Example Statistical Coding	HCUP Tools Programs
	X	X	X	X
	X		X	X
	X			X
			X	

MS Excel and Access are NOT GOOD options!

HCUP-US for Tools and Software



Favorites

HCUPnet

[HCUPnet](#) is an interactive tool for identifying, tracking, analyzing, and comparing statistics on hospital and emergency care. HCUPnet provides statistics from the HCUP nationwide databases ([NIS](#), [KID](#), and [NEDS](#)) and the State-level databases ([SID](#), [SASD](#), and [SEDD](#)) for those States that have agreed to participate.

MONAHRQ

[MONAHRQ](#) is a software product that enables organizations - such as state and local data organizations, Chartered Value Exchanges, hospital systems, and health plans - to input their own hospital administrative data and generate a data-driven Web site.

AHRQ Quality Indicators (QIs)

[AHRQ Quality Indicators \(QIs\)](#) use hospital administrative data to highlight potential quality concerns, identify areas that need further study and investigation, and track changes over time.

HCUP Tools & Software

The HCUP Tools and Software are analytic methods that, when applied to HCUP databases, systematically create new data elements from existing data, thereby enhancing a researcher's ability to conduct analyses. While designed to be used with HCUP databases, they may be applied to other administrative databases as well.

Tools for ICD-9-CM

Clinical Classifications Software (CCS) for ICD-9-CM

[Clinical Classifications Software \(CCS\)](#) provides a method for classifying ICD-9-CM diagnoses or procedures into clinically meaningful categories, which can be used for aggregate statistical reporting of a variety of types. (Updated for codes valid through FY 2015.)

Chronic Condition Indicator

The [Chronic Condition Indicator \(CCI\)](#) provides users an easy way to categorize ICD-9-CM diagnosis codes into one of two categories: chronic or not chronic. The tool can also assign ICD-9-CM diagnosis codes into 1 of 18 body system categories. (Codes valid through FY 2015.)

Comorbidity Software

[Comorbidity Software](#) assigns variables that identify coexisting conditions on hospital discharge records. (Codes valid through FY 2015.)

Procedure Classes

[Procedure Classes](#) facilitate research on hospital services using administrative data by identifying whether a procedure is (a) diagnostic or therapeutic, and (b) minor or major in terms of invasiveness and/or resource use. (Updated for codes valid through FY 2015.)

Tools for ICD-10-CM/PCS

HCUP tools have been translated to ICD-10-CM/PCS in anticipation of conversion to the new coding system on October 1, 2015. We welcome comments. If you have questions or suggestions for changes, please contact hcup@ahrq.gov.



Clinical Classifications Software (CCS) for ICD-10-CM/PCS

[Clinical Classifications Software \(CCS\) for ICD-10-CM/PCS](#) provides a method for classifying ICD-10-CM diagnoses or ICD-10-PCS procedures into clinically meaningful categories, which can be used for aggregate statistical reporting of a variety of types. (Updated for codes valid through FY 2014.)



Chronic Condition Indicator for ICD-10-CM

[Chronic Condition Indicator for ICD-10-CM](#) provides users an easy way to categorize ICD-10-CM diagnosis codes into one of two categories: chronic or not chronic. The tool can also assign ICD-10-CM diagnosis codes into 1 of 18 body system categories. (Updated for codes valid through FY 2014.)

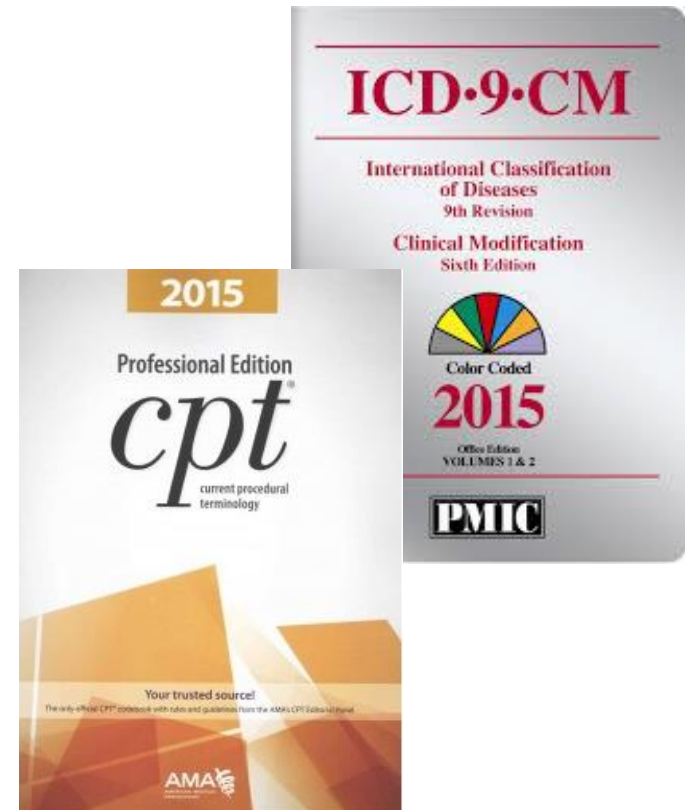


Comorbidity Software for ICD-10-CM

https://www.hcup-us.ahrq.gov/tools_software.jsp

Value-Added Clinical and Quality Measurement Tools

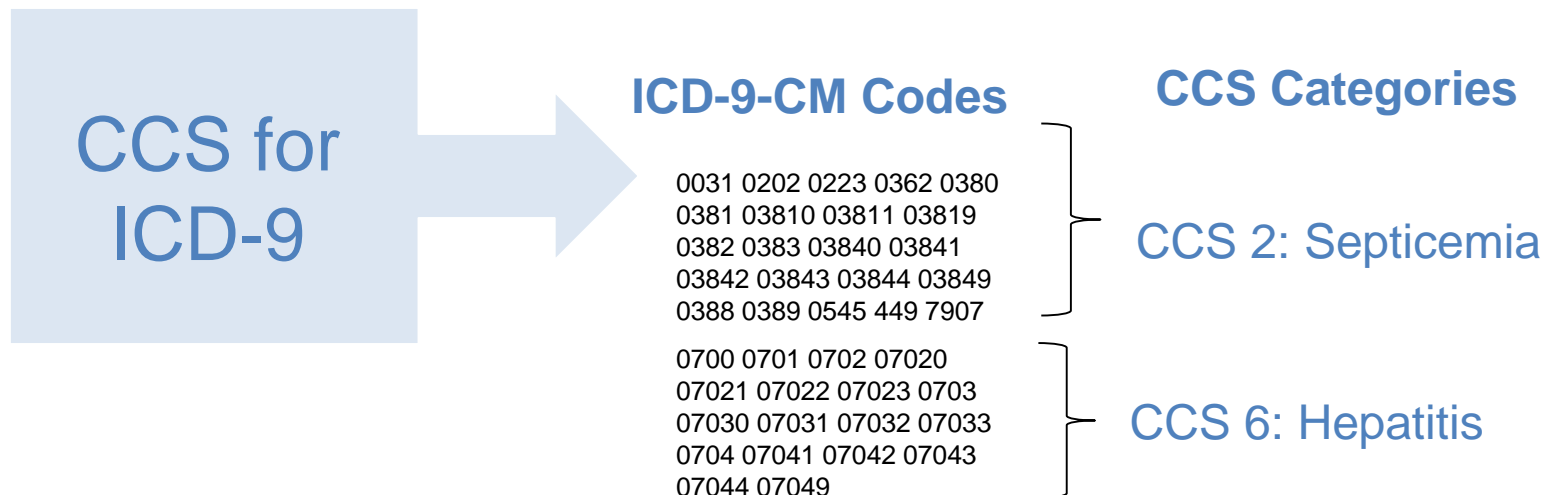
- Clinical Classifications Software*
- Procedure Classes*
- Chronic Condition Indicator*
- Comorbidity Software*
- Utilization Flags*
- Surgery Flags*
- AHRQ Quality Indicators
 - Prevention Quality Indicators
 - Inpatient Quality Indicators
 - Patient Safety Indicators
 - Pediatric Quality Indicators



* Already available on most HCUP databases

Clinical Classifications Software (CCS)

- Clusters diagnosis and procedure codes into categories
 - ▶ >12,000 diagnosis codes → ~260 categories
 - ▶ > 4,000 procedure codes → ~230 categories
- Useful for presenting descriptive statistics, understanding patterns

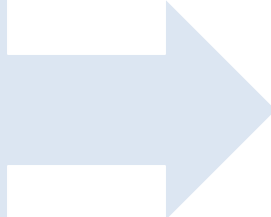


Clinical Classifications Software (CCS)

- ICD-9-CM diagnoses and procedures
 - ▶ Single level
 - ▶ Multilevel
- ICD-10-CM diagnoses and ICD-10-PCS procedures
 - ▶ Single level
- ICD-10 for mortality
- Services and Procedures
 - ▶ Current Procedural Terminology (AMA)

- Groups procedure codes into one of four categories
 - ▶ ICD-10-PCS procedure codes (Beta)
 - ▶ ICD-9-CM procedure codes
- Major procedures defined as OR procedures (DRGs)

ICD-10-PCS
or ICD-9-CM
Procedure
Codes

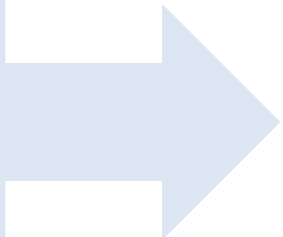


1. Minor Diagnostic
Ex: Electrocardiogram
2. Minor Therapeutic
Ex: Pacemaker
3. Major Diagnostic
Ex: Pericardial Biopsy
4. Major Therapeutic
Ex: CABG

Chronic Condition Indicator (CCI)

- Groups diagnosis codes into Chronic or Nonchronic Categories
 - ICD-10-CM diagnosis codes (Beta)
 - ICD-9-CM diagnosis codes

ICD-10-CM
or ICD-9-CM
Diagnosis
Codes

- 
1. Chronic
Ex: Diabetes
 2. Nonchronic
Ex: Food Poisoning

- Creates and appends indicator flags to each record for 29 major comorbidities
 - ▶ ICD-10-CM diagnosis codes (Beta)
 - ▶ ICD-9-CM diagnosis codes

ICD-10-CM
or ICD-9-CM
Codes, DRGs
on
Administrative
Data

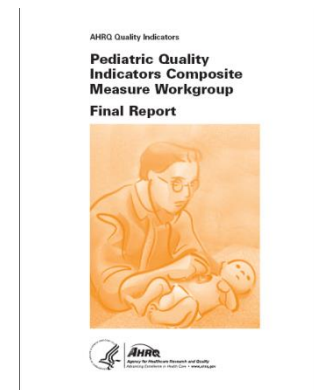
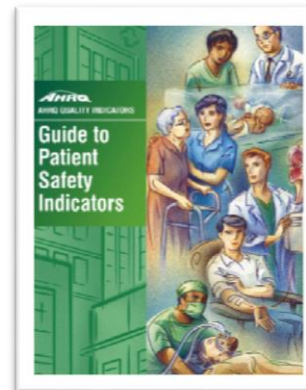
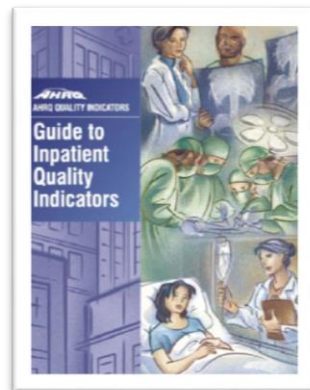
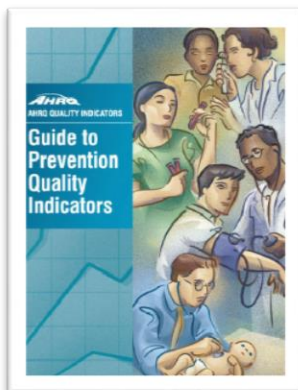
Comorbidity
Software



29 Comorbidity
Groups

Valvular disease
Pulm circ disorders
Peripheral vascular dx
Hypertension
Paralysis
Other neuro disorders
Chronic pulmonary dx
DM w/o complications
DM w/ complications
Hypothyroidism
Renal failure
Liver disease ...

- Uses inpatient administrative data to create measures of health care quality
 - ▶ Four modules:
 1. Prevention Quality Indicators (PQI)
 2. Inpatient Quality Indicators (IQI)
 3. Patient Safety Indicators (PSI)
 4. Pediatric Quality Indicators (PDI)



- Supplemental Variables for Readmission Analyses
- Cost-to-Charge Ratio Files
- Hospital Market Structure Files
- Trend Weights Files (NIS & KID)
- NIS Hospital Ownership File
- AHA Linkage Files



- **Charges:** What the hospital charged for care (includes charge BEFORE discount)
- **Costs:** What it cost the hospital to provide the care

HCUP Databases include **CHARGE** information
COST information can be estimated using cost-to-charge ratios

HCUP Supplemental Variables for Revisit Analyses

- Allow linkage across settings and time
 - ▶ Hospital readmissions
 - ▶ ED visits following hospital discharge
 - ▶ Inpatient hospitalizations following ambulatory surgery visits
- Adhere to strict privacy guidelines





HCUPnet Overview

- HCUPnet is a **free, on-line query system** based on the HCUP databases
- Using HCUPnet's easy step-by-step query system, you can generate tables and graphs on **national** and **regional** statistics and trends for community hospitals in the U.S.
- HCUPnet also provides **county-level statistics** for select States and with statistics based on the **AHRQ Quality Indicators (QIs)**



Welcome to H-CUPnet

HCUPnet is a free, on-line query system based on data from the Healthcare Cost and Utilization Project (HCUP). It provides access to health statistics and information on hospital inpatient and emergency department utilization.

Begin your query here -

Statistics on Hospital Stays

National Statistics on All Stays

Create your own statistics for national and regional estimates on hospital use for all patients from the HCUP National (Nationwide) Inpatient Sample (NIS). Overview of the National (Nationwide) Inpatient Sample (NIS) [↗](#)

National Statistics on Mental Health Hospitalizations

Interested in acute care hospital stays for mental health and substance abuse? Create your own national statistics from the NIS.

State Statistics on All Stays

Create your own statistics on stays in hospitals for participating States from the HCUP State Inpatient Databases (SID). Overview of the State Inpatient Databases (SID) [↗](#)

Hospital Readmissions

Readmission Summary Tables

Ready-to-use information on readmissions to the hospital within 30 days of discharge.

Statistics on Emergency Department Use

National Statistics on All ED Visits

Create your own statistics for national and regional estimates on emergency department visits for all patients from the HCUP Nationwide Emergency Department Sample (NEDS). Overview of the Nationwide Emergency Department Sample (NEDS) [↗](#)

National Statistics on Children

Create your own statistics for national estimates on use of hospitals by children (age 0-17 years) from the HCUP Kids' Inpatient Database (KID). Overview of the Kids' Inpatient Database (KID) [↗](#)

National and State Statistics on Hospital Stays by Payer - Medicare, Medicaid, Private, Uninsured

Interested in hospital stays billed to a specific payer? Create your own statistics for a payer, alone or compared to other payers from the NIS, KID, and SID.

Quick National or State Statistics

Ready-to-use tables on commonly requested information from the HCUP National (Nationwide) Inpatient Sample (NIS), the HCUP Kids' Inpatient Database (KID), or the HCUP State Inpatient Databases (SID).

Quick Statistics on Readmissions

Sortable tables that provide instant information on 30-day readmissions to the hospital.

Quick National or State Statistics on All ED Visits

Ready-to-use tables on commonly requested information from the NEDS, SEDD, and SID.

370,000 Web site Visits Annually

Search AHRQ

Go

www.ahrq.gov

First Time Visitor?

[HCUPnet overview](#)
[How does HCUPnet work?](#)
[HCUPnet methodology?](#)
[HCUPnet definitions?](#)

What's New?

- 2012 nationwide and state ED data -- new database just released. (12/17/2014) **Just Added!**
- 2012 Community-level Statistics added. (11/07/2014) **Just Added!**
- 2012 national data on AHRQ Quality Indicators. (10/24/2014)
- All NIS results prior to 2012 recalculated to permit trend analysis **Important Notice!**
- New 2009-2012 readmission data added. (09/24/2014)
- 2012 data for Kids' Inpatient Database (KID). (07/24/2014)
- Cost information for participating states in 2012. (07/11/2014)
- 2012 nationwide hospital data now available. (06/09/2014)

Projected estimates [↗](#) on specific conditions are periodically available here.



H-CUP
HEALTHCARE COST AND UTILIZATION PROJECT

More information on HCUP data, tools, and reports [↗](#)

What is HCUP?

Brief description - what is HCUP?
Want to purchase data to do your own analysis?

The statistics in HCUPnet would not be possible without partner



HCUPnet: Nationwide Inpatient Data



U.S. Department of Health & Human Services

Skip Navigation

www.hhs.gov

AHRQ Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

Search AHRQ

www.ahrq.gov



HCUPnet

National and regional estimates on hospital use for all patients from the HCUP National Inpatient Sample (NIS)

[» Help](#)
[» Medical dictionary](#)
[» What is HCUP ?](#)
[» HCUPnet definitions](#)
[» HCUP Home](#)

HCUPnet Home	Lay or researcher	Select type of query	Select year	Select diagnoses or procedures	Principal or all-listed	Restrict tables	Select codes	Outcomes and measures	Patient and hospital characteristics	Results
------------------------------	-----------------------------------	--------------------------------------	-----------------------------	--	---	---------------------------------	------------------------------	---------------------------------------	--	-------------------------

Results

- Display results in a printer-friendly version (Try printing in landscape for best results)
- Save results as an Excel spreadsheet
- Create a results page to bookmark or add to favorites (Bookmarking the current page will not return you to these results)
- Email a link to this page (Your browser must be configured to send email)
- Repeat this query on another database
- Run a new query

2012 National statistics - principal diagnosis only

Outcomes for CCS principal diagnosis category 2 Septicemia (except in labor)

		Total number of discharges	Rate of discharges per 100,000 persons	Costs, \$ (mean)	Standard errors		
					Total number of discharges	Rate of discharges per 100,000 persons	Costs, \$ (mean)
All discharges		1,132,655 (100.00%)	360.8	18,444	14,040	4.5	179
Age group	<1	9,880 (0.87%)	247.2	21,228	523	13.1	1,593
	1-17	9,340 (0.82%)	13.4	29,210	543	0.8	1,850
	18-44	123,465 (10.90%)	108.3	18,653	2,128	1.9	317
	45-64	317,725 (28.05%)	383.7	21,420	4,373	5.3	260
	65-84	476,975 (42.11%)	1,280.0	18,073	6,318	17.0	161
	85+	195,190 (17.23%)	3,287.2	13,695	3,023	50.9	178
	Missing	80 (0.01%)	---	28,656	23	---	7,250



HCUPnet: Nationwide ED Data



U.S. Department of Health & Human Services



Search AHRQ



H-CUPnet

Information on ED visits from the HCUP Nationwide Emergency Department Sample (NEDS)

HCUPnet Home

Select types
of visits

Select type
of query

Select
year

Select diagnoses
or procedures

First-listed
or all-listed

Select
codes

Outcomes and
measures

Patient and
hospital characteristics

Results

- ▶ Display results in a printer-friendly version (Try printing in landscape for best results)
- ▶ Save results as an Excel spreadsheet
- ▶ Create a results page to bookmark or add to favorites (Bookmarking the current page will not return you to these results)
- ▶ Email a link to this page (Your browser must be configured to send email)
- ▶ Repeat this query on another database
- ▶ Run a new query

2012 National statistics - first-listed diagnosis only
All ED visits

Total number of visits for CCS first-listed diagnosis category
7 Viral infections

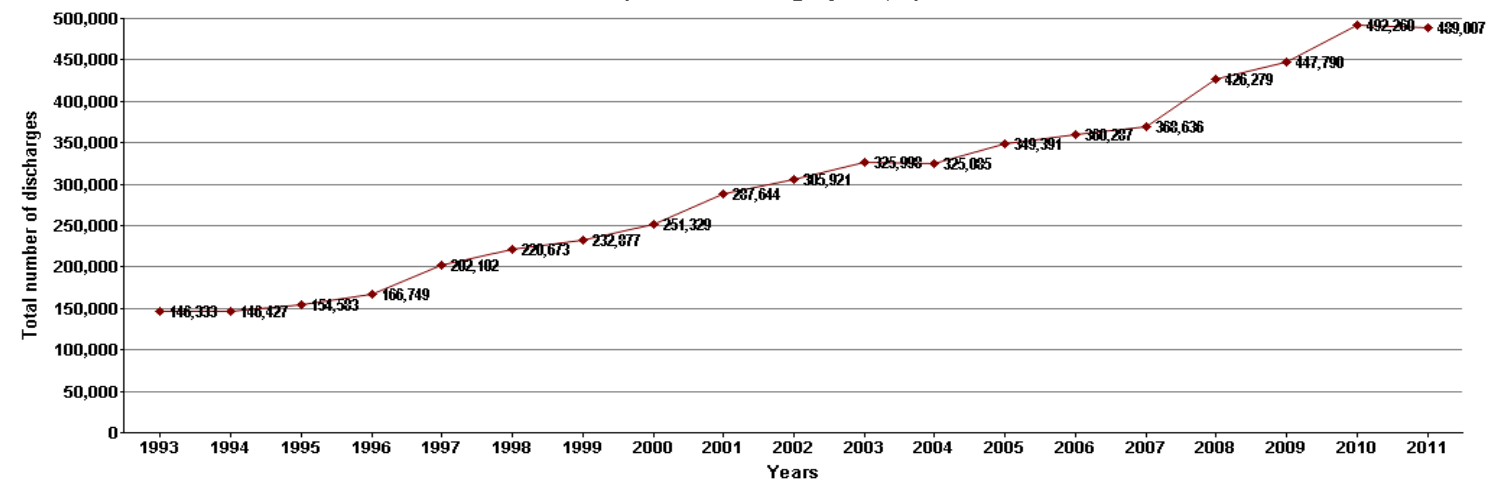
	All ED Visits	ED visits with admission to the same hospital	Discharged from the ED	Standard errors		
				All ED Visits	ED visits with admission to the same hospital	Discharged from the ED
All visits	1,554,722 (100.00%)	52,773 (3.39%)	1,501,949 (96.61%)	64,812	2,639 (0.17%)	63,688 (0.17%)
Age group <1	178,937 (11.51%)	6,877 (3.84%)	172,060 (96.16%)	13,203	681 (0.35%)	12,883 (0.35%)
1-17	721,163 (46.39%)	10,243 (1.42%)	710,921 (98.58%)	44,097	981 (0.11%)	43,566 (0.11%)
18-44	416,580 (26.79%)	11,563 (2.78%)	405,017 (97.22%)	13,746	617 (0.14%)	13,508 (0.14%)
45-64	148,842 (9.57%)	9,779 (6.57%)	139,062 (93.43%)	4,442	528 (0.30%)	4,187 (0.30%)
65-84	74,383 (4.78%)	10,774 (14.48%)	63,609 (85.52%)	2,010	513 (0.52%)	1,715 (0.52%)
85+	14,720 (0.95%)	3,532 (23.99%)	11,188 (76.01%)	481	201 (1.01%)	373 (1.01%)
Missing	*	*	*	*	*	*

Results

- ▶ [Display results in a printer-friendly version](#) (Try printing in landscape for best results)
- ▶ [Save results as an Excel spreadsheet](#)
- ▶ [Create a results page to bookmark or add to favorites](#) (Bookmarking the current page will not return you to these results)
- ▶ [Email a link to this page](#) (Your browser must be configured to send email)
- ▶ [Repeat this query on another database](#)
- ▶ [Do Not Show Graphs of Trend Data](#)
- ▶ [Run a new query](#)

National statistics - all-listed

Total number of discharges
CCS all-listed procedure category 158, Spinal fusion



Number of discharges

CCS all-listed procedure category and name	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
158 Spinal fusion	146,333	146,427	154,583	166,749	202,102	220,673	232,877	251,329	287,644	305,921	325,998	325,085	349,391	360,287	368,636	426,279	447,790	492,260	489,007

Number of discharges - Standard Errors

CCS all-listed procedure category and name	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
158 Spinal fusion	8,291	8,617	9,171	9,572	11,305	11,829	12,557	11,913	14,686	15,195	17,292	15,849	18,995	19,445	18,762	23,643	23,989	23,976	25,527

Results

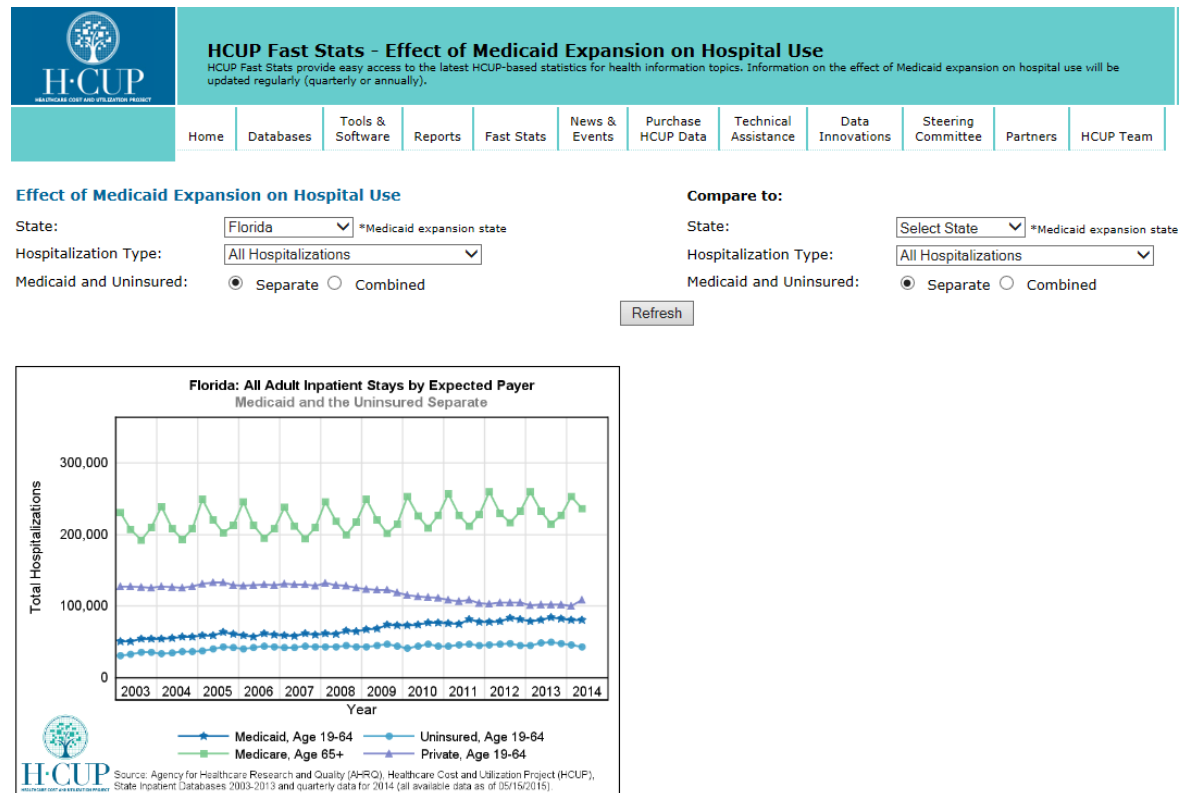
- ▶ [Display results in a printer-friendly version](#) (Try printing in landscape for best results)
- ▶ [Save results as an Excel spreadsheet](#)
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- ▶ [Email a link to this page](#) (Your browser must be configured to send email)
- ▶ [Run a new query](#)
- ▶ [Show causes of readmissions](#)

All patient readmissions within 30 days
National statistics, 2012

Index stay - Overall

		Index Stays		Readmitted within 30 days for any cause		
		Number of stays	Mean cost \$ per stay	Number of stays	Percent readmitted	Mean cost \$ per stay
Overall		28,833,405	11,160	4,041,045	14.0	13,003
Age group	1-17	1,354,434	9,566	140,141	10.3	14,734
	18-44	8,234,233	7,621	799,516	9.7	10,300
	45-64	8,101,243	12,912	1,260,752	15.6	13,736
	65+	11,143,495	12,682	1,840,635	16.5	13,547
Sex	Male	11,763,424	12,862	1,901,405	16.2	13,705
	Female	17,069,970	9,986	2,139,638	12.5	12,380
Payer	Medicare	13,079,314	12,567	2,294,895	17.5	13,395
	Medicaid	5,464,874	9,137	767,902	14.1	11,883
	Private insurance	7,621,495	10,653	689,467	9.0	13,859
	Uninsured	1,553,362	8,774	166,367	10.7	9,957
Median income for zipcode	First quartile (lowest)	9,238,049	10,310	1,393,039	15.1	11,830
	Second quartile	6,904,430	10,911	964,162	14.0	12,607
	Third quartile	6,479,833	11,408	876,076	13.5	13,494
	Fourth quartile (highest)	5,764,904	12,539	744,241	12.9	15,187
Patient residence	Metropolitan	23,368,789	11,178	3,300,710	14.1	13,185
	Non-Metropolitan	5,464,616	11,088	740,334	13.5	12,207

- HCUP will release new product in July that provides easy access to the latest HCUP-based statistics for specific health information topics.
 - ▶ Uses visual statistical displays to convey complex information at a glance, including graphs, trend figures and simple tables.
 - ▶ Updated regularly using quarterly or full year data files as they become available.





HEALTHCARE COST AND
UTILIZATION PROJECT

STATISTICAL BRIEF #185

December 2014

Utilization of Intensive Care Services, 2011

Marguerite L. Barrett, M.S., Mark W. Smith, Ph.D., Anne Elkhäuser, Ph.D., Leah S. Honigman, M.D., M.P.H., and Jesse M. Pines, M.D.

Introduction

As health care costs rise, there is increased emphasis on cost-effective care. Hospital stays that involve time in an intensive care unit (ICU) are of particular interest because critical care costs have been rising for decades, reaching 13.4 percent of hospital costs by 2005.¹ From 2002 through 2009, ICU stays rose at three times the rate of general hospital stays without an increase in severity of illness.² The reason for higher utilization of ICUs is unclear. Because ICU stays represent a costly segment of health care spending, it is important to understand patterns and variation in ICU utilization.

This Healthcare Cost and Utilization Project (HCUP) Statistical Brief presents data on ICU utilization by adults in U.S. general medical and surgical hospitals in 2011. For this brief, ICU utilization includes various types of intensive care such as medical, surgical, coronary, pulmonary, psychiatric, burn, and trauma. Hospital stays and aggregate hospital charges are presented for discharges with and without an ICU stay. Conditions and procedures with high and low utilization of ICU services are reported with the percentage of total hospital charges for ICU services. In addition, ICU utilization is compared for conditions and procedures with and without complications or comorbidities. Finally, the types of hospitals with high and low ICU utilization are presented.

This Statistical Brief used the HCUP State Inpatient Databases (SID) in 2011 for 29 States that included revenue center codes identifying ICU and coronary care unit (CCU) care. The analysis considered 16.9 million inpatient stays from 1,882 hospitals. To our knowledge, this is the first study of all-cause ICU utilization in a broad cross-section of U.S. hospitals.

- In 2011, 26.9 stays in 29 intensive care charges, account percent of ag hospital char
- Common cor procedures v utilization vari systems. Th ICU use (63 respiratory su
- Cardiac cond for 8 of the 11 procedures v utilization. IC cardiac cond 40.6 percent pain to 70.3 acute myoca major compl comorbidities
- Hospital stay services were costly than of
- ICU services three times n patients expe complications
- Greater utiliz tended to occ were large, p located in me trained medi had a high-te



HEALTHCARE COST AND
UTILIZATION PROJECT

STATISTICAL BRIEF

December 2014

Most Frequent Operating Room Procedures Performed in U.S. Hospitals, 2003–2012

Kathryn R. Finger, Ph.D., M.P.H., Carol Stocks, Ph.D., R.N., Audrey J. Weiss, Ph.D., and Claudia A. Steiner, M.D., M.P.H.

Introduction

Nearly two-thirds of all hospitalizations involve some type of procedure.¹ Many procedures that occur in the hospital setting, such as blood transfusions and vaccinations, are performed outside the operating room (OR). Other procedures, such as hip replacement and spinal fusion, are surgical in nature and are performed in the OR. In 2011, nearly 29 percent of hospital stays involved OR procedures and 48 percent of hospital costs were for stays that involved OR procedures.² Mean hospital costs for stays with OR procedures were more than double the mean costs for stays without OR procedures.³

This Healthcare Cost and Utilization Project (HCUP) Statistical Brief presents data on OR procedures that were performed most frequently in U.S. hospitals in 2012 among all nonmaternal and nonneonatal stays. Only data on OR procedures associated with an inpatient hospital stay are included. The OR procedures with the greatest change in occurrence (either increasing or decreasing) from 2003 to 2012 are provided. Finally, the OR procedures that were performed most frequently and underwent the greatest change in occurrence are presented by patient age group, patient sex, and expected primary payer.

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¹ Plummer A, Wier LM, Stock C. Most Frequent Procedures Performed in U.S. Hospitals, 2011. HCUP Statistical Brief #185. October 2013. Agency for Healthcare Research and Quality, Rockville, MD. <http://www.hcup-us.ahrq.gov/hospitalization/briefs/185.pdf>. Accessed August 5, 2014.

² Weiss AJ, Elkhäuser A, Andrews ME. Characteristics of Operating Room Procedures in U.S. Hospitals, 2011. HCUP Statistical Brief #170. February 2014. Agency for Healthcare Research and Quality, Rockville, MD. <http://www.hcup-us.ahrq.gov/hospitalization/briefs/170-Operating-Room-Procedures-in-U.S.-Hospitals-2011.pdf>. Accessed August 5, 2014.

³ Ibid.



HEALTHCARE COST AND
UTILIZATION PROJECT

STATISTICAL BRIEF #187

December 2014

Overview of Hospital Stays for Children in the United States, 2012

Whitney P. Witt, Ph.D., M.P.H., Audrey J. Weiss, Ph.D., and Anne Elkhäuser, Ph.D.

Introduction

Nearly one out of every six discharges from U.S. hospitals in 2012 was for children aged 17 years and younger, the majority of whom were infants, including newborns.¹ Between 2008 and 2012, the rate of hospitalization decreased by 0.6 percent per year among infants and 0.9 percent per year among children aged 1–17 years.² During this same time period, average annual growth in mean hospital costs per stay was 6.7 percent for infants and 6.4 percent for children aged 1–17 years, more than three times the rate of cost growth of any other age group.³

A variety of factors may explain the recent trends in children's hospitalizations, including changes in the conditions for which children are being treated. One recent study of children's inpatient stays in pediatric hospitals found that the number of patients, aggregate hospital charges, and number of hospital days grew more rapidly between 2004 and 2009 among children with chronic conditions than among those without chronic conditions.⁴ Children with multiple chronic conditions also were more likely to be covered by Medicaid than were those without a chronic condition.⁵ Understanding the reasons why children are hospitalized and examining trends over time is critical to inform clinical practice and health policy.

This Healthcare Cost and Utilization Project (HCUP) Statistical Brief presents data on hospital inpatient stays among children aged 17 years and younger in 2012. Data were taken from the HCUP Kids' Inpatient Database (KID), which is created once every 3 years. The KID is the only database specifically developed to study hospitalizations among children. This

Highlights

- In 2012 there were nearly 5.9 million hospital stays for children in the United States, of which 3.9 million were neonatal stays and 104,700 were maternal stays for pregnant teens.
- Between 2008 and 2012, the number of neonatal stays (births) fluctuated around 4.0 million stays, reaching a high of 4.3 million in 2006. Hospital stays for teen pregnancies decreased by 47 percent over the 12-year period.
- In 2012, Medicaid covered over half (51.6 percent) of nonneonatal and nonmaternal stays for children and about a quarter (26.4 percent) of stays for adults aged 18–44 years. In contrast, 2.7 percent of stays for children were uninsured compared with 16.9 percent of stays for adults aged 18–44 years.
- From 2000 to 2012, the proportion of hospital stays for children paid by Medicaid increased by 33 percent, and the proportion paid by private insurance decreased by 21 percent.
- For most conditions, the rate of hospitalization for children decreased or remained relatively unchanged from 2000 to 2012. Only skin conditions showed an increase in rate of hospitalization (35.6 percent). Substantial decreases in rates of hospitalization over the 12-year period were observed for HIV infection (89.9 percent) and substance abuse (60.1 percent).
- Respiratory diagnoses—pneumonia, acute bronchitis, and asthma; mood disorders; appendicitis; and epilepsy/convulsions were the most common specific conditions for which children were hospitalized.

¹ Weiss AJ, Elkhäuser A. Overview of Hospital Stays in the United States, 2012. HCUP Statistical Brief #186. October 2014. Agency for Healthcare Research and Quality, Rockville, MD. <http://www.hcup-us.ahrq.gov/hospitalization/briefs/186-Hospitalization-in-the-United-States-2012.pdf>. Accessed October 16, 2014.

² Moore B, Levitt K, Elkhäuser A. Costs for Hospital Stays in the United States, 2012. HCUP Statistical Brief #181. October 2014. Agency for Healthcare Research and Quality, Rockville, MD. <http://www.hcup-us.ahrq.gov/hospitalization/briefs/181-Hospital-Costs-in-the-United-States-2012.pdf>. Accessed October 27, 2014.

³ Ibid.

⁴ Berry JG, Hall M, Hall DE, et al. Inpatient growth and resource use in 28 children's hospitals. *JAMA Pediatrics*. 2013;167(12):170–7.

⁵ Ibid.


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- [Kids' Inpatient Database \(KID\)](#)
- [Nationwide Emergency Department Sample \(NEDS\)](#)

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- [State Emergency Department Databases \(SEDD\)](#)

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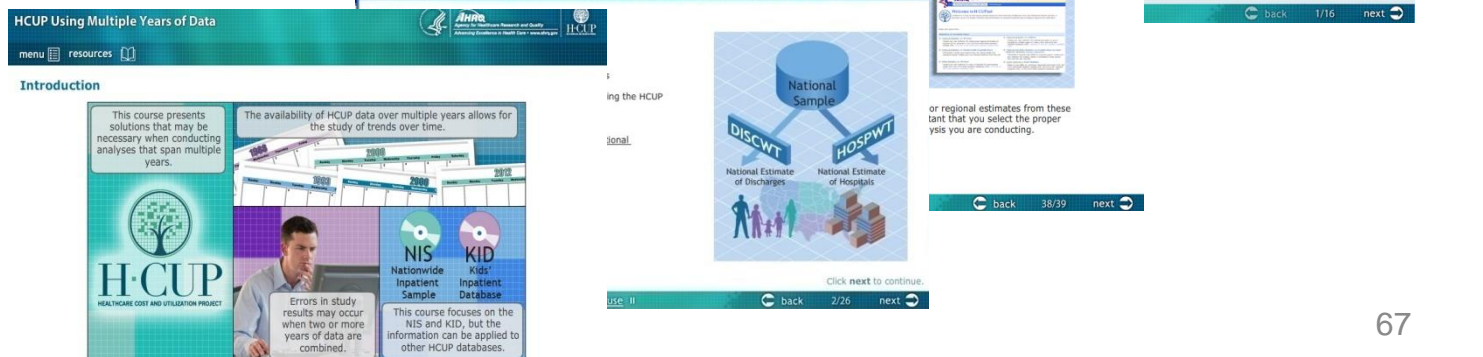
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- [The Value of Hospital Discharge Data](#) (PDF file, 664 KB) (Posted May 2005)
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For Data Orders

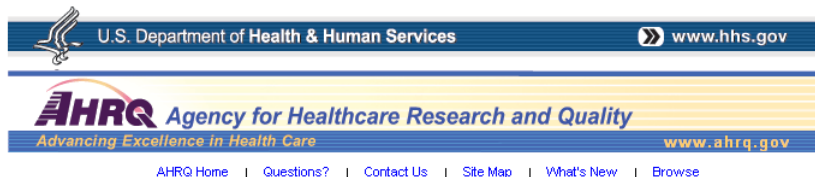
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